ReFlx™ 120 “Plus” COLLISION AVOIDANCE SYSTEM

**SYSTEM INCLUDES:**

1. Two (2) Channel Sensor with 16 ft. control cable (sensing range 20-120 ft.)
1. Single (1) Channel Sensor with 16 ft. control cable (sensing range 1.5-20 ft.)
1. Controller
1. Diamond Reflective Target

- SD-1 = Sensing Distance for Channel 1
- SD-2 = Sensing Distance for Channel 2
- SD-3 = Sensing Distance for Channel 3
- RD = Distance -- CL of Crane to ReFlx Sensor

The channels on the 2-Channel sensor are (Channel 1 and Channel 2).
The channel on the single channel sensor is (Channel 3).
- Channel 1 is used to provide a “slow down” command or warning signal
- Channel 2 is used to provide a primary stop command to motion control
- Channel 3 is used as a backup to Channel 2 and should be set at the same setting range as Channel 2

**NOTE:** The function of the ReFlx 120 “Plus” relay contacts is similar to that of slow-down and end-of-travel limit switches. Test all motion under worst case scenario before putting crane into operation.
ReFlx 120 “Plus” APPLICATION GUIDELINES

Contactor Control
Bridge and trolley motions using reversing contactors for control rely on the crane’s mechanical brakes for stopping. Therefore, the buffer zone (minimum distance to mating crane or obstruction) should be sized to allow for future brake wear.

Adjustable Frequency Crane Control
Because adjustable frequency drives (AFDs) have various programmable stopping options, consideration should be given to these various means when setting up the ReFlx 120 “Plus” system.

**Using the AFD Limit Switch Inputs**
Most modern AFDs include programmable limit switch input terminals for each direction of travel (Upper Limit 1 & Upper Limit 2) with provision for automatic slow-down. As soon as the bridge reaches the sensing distance for Channel 1, the drive will command the crane to slow down using a separately programmable speed switch frequency and deceleration time. When the bridge reaches the sensing distance for Channel 2 or 3, the drive will “decelerate at stop command” or provide “immediate stop at stop command” (see definitions below), depending on how the drive is programmed. The input to the drive from Channel 3 can be run parallel to that of Channel 2, or run to a multi-function input terminal on the AFD.

**Decelerate at Stop Command**
Upon receiving a *Stop Command* from the ReFlx 120 “Plus” system, the output frequency of the AFD decreases to near zero at the programmed deceleration ramp; and the brake is commanded to set. See Table I, Bulletin A260.10, for approximate stopping distances at various deceleration times. These stopping distances will be slightly longer when the AFD is programmed with an S-Curve ramp.

**Immediate Stop at Stop Command**
Upon receiving a *Stop Command* from the ReFlx 120 “Plus” system, the AFD base blocks the main output transistors. This electrically disconnects the motor from the AFD, and through the brake interlock, commands the brake to set. In this mode, the crane functions similar to a contactor control and relies on the crane’s mechanical brakes for stopping. Therefore, the buffer zone (minimum distance to mating crane or obstruction) should be sized to allow for future brake wear.

**NOTE:** It may be necessary to re-calibrate the ReFlx 120 “Plus” system whenever the deceleration time is changed. Test all motions under worst case scenario before putting crane into operation.

For proper operation, ensure that the sensor and target are in the same horizontal plane throughout the range of travel.

Contact Electromotive Systems for applications involving other types of controls or options.
ReFlx- 120™ “Plus” CRANE TO CRANE AVOIDANCE SYSTEM

1. Two (2) Channel Sensor with 16 ft. control cable (sensing range 20-120 ft.)
2. Single (1) Channel Sensor with 16 ft. control cable (sensing range 1.5-20 ft.)
3. Controller
4. Diamond Reflective Target

The channels on the 2-channel sensor are (Channel 1 and Channel 2).
The channel on the single channel sensor is (Channel 3).
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- Channel 3 is used as a backup to Channel 2 and should be set at the same sensing range as Channel 1

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